

CLAIMS

1. A substantially purified peptide which comprises a sequence selected from the group consisting of:
  - 5 i) an amino acid sequence as provided in SEQ ID NO:4,
  - ii) an amino acid sequence which is at least 60% identical to SEQ ID NO:4,
  - iii) an amino acid sequence as provided in SEQ ID NO:5,
  - iv) an amino acid sequence which is at least 80% identical to SEQ ID NO:5,
  - v) an amino acid sequence as provided in SEQ ID NO:48,
  - 10 vi) an amino acid sequence which is at least 70% identical to SEQ ID NO:48,
  - vii) an amino acid sequence as provided in SEQ ID NO:53,
  - viii) an amino acid sequence which is at least 70% identical to SEQ ID NO:53,
  - ix) a biologically active fragment of any one of i) to viii), and
  - x) a precursor comprising the amino acid sequence according to any one of i) to
- 15 ix),  
wherein the peptide, or fragment thereof, exhibits antifungal and/or antibacterial activity.
2. The peptide of claim 1 which can be purified from an insect.
- 20 3. The peptide of claim 1 or claim 2 which can be purified from a lepidopteran insect of the family Pyralidae.
4. The peptide according to any one of claims 1 to 3, wherein the peptide exhibits  
25 antifungal activity against a fungus selected from the group consisting of: *Fusarium graminearum*, *Fusarium oxysporum*, *Ascochyta rabiei*, *Candida albicans*, *C. parapsilosis*, *C. glabrata*, *C. krusei*, *C. tropicalis*, *Cryptococcus neoformans* and *Leptosphaeria maculans*.
- 30 5. The peptide according to any one of claims 1 to 4 which is fused to at least one other polypeptide/peptide sequence.
6. An isolated polynucleotide, the polynucleotide comprising a sequence selected  
35 from the group consisting of:
  - i) a sequence of nucleotides provided in SEQ ID NO:9 or SEQ ID NO:10;
  - ii) a sequence of nucleotides provided in SEQ ID NO:11;

- iii) a sequence of nucleotides provided in SEQ ID NO:12;
- iv) a sequence of nucleotides provided in SEQ ID NO:13;
- v) a sequence of nucleotides provided in SEQ ID NO:50;
- vi) a sequence of nucleotides provided in SEQ ID NO:51;
- 5 vii) a sequence of nucleotides provided in SEQ ID NO:55;
- viii) a sequence of nucleotides provided in SEQ ID NO:56;
- ix) a sequence encoding a peptide according to any one of claims 1 to 5;
- x) a sequence of nucleotides which is at least 66% identical to SEQ ID NO:9, SEQ ID NO:10, or SEQ ID NO:12;
- 10 xi) a sequence of nucleotides which is at least 71% identical to SEQ ID NO:11 or SEQ ID NO:13;
- xii) a sequence of nucleotides which is at least 62% identical to SEQ ID NO:50, or SEQ ID NO:51;
- xiii) a sequence of nucleotides which is at least 62% identical to SEQ ID NO:55,
- 15 or SEQ ID NO:56; and
- xiv) a sequence which hybridizes to any one of (i) to (viii) under high stringency conditions.

7. The polynucleotide of claim 6, wherein the polynucleotide encodes a peptide  
20 with antifungal and/or antibacterial activity.

8. A vector comprising the polynucleotide of claim 6 or claim 7.

9. A host cell comprising the polynucleotide of claim 6 or claim 7, or the vector of  
25 claim 8.

10. The host cell of claim 9 which is a plant cell.

11. A process for preparing a peptide according to any one of claims 1 to 5, the  
30 process comprising cultivating a host cell according to claim 9 or claim 10 under  
conditions which allow expression of the polynucleotide encoding the peptide, and  
recovering the expressed peptide.

12. A composition comprising a peptide according to any one of claims 1 to 5, and  
35 one or more acceptable carriers.

13. A composition comprising a polynucleotide according to claim 6 or claim 7, and one or more acceptable carriers.
14. A method for killing, or inhibiting the growth and/or reproduction of a fungus and/or a bacteria, the method comprising exposing the fungus and/or bacteria to a peptide according to any one of claims 1 to 5.
15. A transgenic plant, the plant having been transformed with a polynucleotide according to claim 6 or claim 7, wherein the plant produces a peptide according to any 10 one of claims 1 to 5.
16. A method of controlling fungal and/or bacterial infections of a crop, the method comprising cultivating a crop of transgenic plants of claim 15.
- 15 17. A transgenic non-human animal, the animal having been transformed with a polynucleotide according to claim 6 or claim 7, wherein the animal produces a peptide according to any one of claims 1 to 5.
18. A method of treating or preventing a fungal and/or bacterial infection in a 20 patient, the method comprising administering to the patient a peptide according to any one of claims 1 to 5.
19. Use of a peptide according to any one of claims 1 to 5 for the manufacture of a medicament for treating or preventing a fungal and/or bacterial infection in a patient.
- 25 20. An antibody which specifically binds a peptide according to any one of claims 1 to 5.
21. A method for killing, or inhibiting the growth and/or reproduction of a fungus, 30 the method comprising exposing the fungus to a peptide which comprises a sequence selected from the group consisting of:
  - i) an amino acid sequence comprising residues 25 to 67 of SEQ ID NO:14,
  - ii) an amino acid sequence as provided in SEQ ID NO:17,
  - iii) an amino acid sequence comprising residues 26 to 67 of SEQ ID NO:15,
  - 35 iv) an amino acid sequence which is at least 75% identical to any one of i) to iii),

- v) an amino acid sequence comprising residues 26 to 66 of SEQ ID NO:18,
- vi) an amino acid sequence which is at least 50% identical to v), and
- vii) a biologically active fragment of any one of i) to vi).

5 22. The method of claim 21, wherein the peptide comprises a sequence selected from the group consisting of:

- i) an amino acid sequence comprising residues 26 to 66 of SEQ ID NO:18,
- ii) an amino acid sequence which is at least 50% identical to i), and
- iii) a biologically active fragment of i) or ii).

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23. A method of controlling fungal infections of a crop, the method comprising cultivating a crop of transgenic plants which produce a peptide which comprises a sequence selected from the group consisting of:

- i) an amino acid sequence comprising residues 25 to 67 of SEQ ID NO:14,
- 15 ii) an amino acid sequence comprising residues 25 to 66 of SEQ ID NO:16,
- iii) an amino acid sequence as provided in SEQ ID NO:17,
- iv) an amino acid sequence comprising residues 26 to 67 of SEQ ID NO:15,
- v) an amino acid sequence which is at least 75% identical to any one of i) to iv),
- vi) an amino acid sequence comprising residues 26 to 66 of SEQ ID NO:18,
- 20 vii) an amino acid sequence which is at least 50% identical to vi), and
- viii) a biologically active fragment of any one of i) to vii).

24. The method of claim 23, wherein the peptide comprises a sequence selected from the group consisting of:

- 25
- i) an amino acid sequence comprising residues 26 to 66 of SEQ ID NO:18,
  - ii) an amino acid sequence which is at least 50% identical to i), and
  - iii) a biologically active fragment of i) or ii).

25. A method of treating or preventing a fungal infection in a patient, the method comprising administering to the patient a peptide which comprises a sequence selected from the group consisting of:

- i) an amino acid sequence comprising residues 25 to 67 of SEQ ID NO:14,
- ii) an amino acid sequence as provided in SEQ ID NO:17,
- iii) an amino acid sequence comprising residues 26 to 67 of SEQ ID NO:15,
- 35 iv) an amino acid sequence which is at least 75% identical to any one of i) to iii),

- v) an amino acid sequence comprising residues 26 to 66 of SEQ ID NO:18,
  - vi) an amino acid sequence which is at least 50% identical to v), and
  - vii) a biologically active fragment of any one of i) to vi).
- 5 26. Use of a peptide which comprises a sequence selected from the group consisting of:
- i) an amino acid sequence comprising residues 25 to 67 of SEQ ID NO:14,
  - ii) an amino acid sequence as provided in SEQ ID NO:17,
  - iii) an amino acid sequence comprising residues 26 to 67 of SEQ ID NO:15,
- 10 iv) an amino acid sequence which is at least 75% identical to any one of i) to iii),
- v) an amino acid sequence comprising residues 26 to 66 of SEQ ID NO:18,
  - vi) an amino acid sequence which is at least 50% identical to v), and
  - vii) a biologically active fragment of any one of i) to vi)
- 15 for the manufacture of a medicament for treating or preventing a fungal infection in a patient.
27. A kit comprising a peptide according to any one of claims 1 to 5.